MCV4U Name:_____

Vectors Unit Test – PRACTICE VERSION

Expectation	Level Achieved
C2 - perform operations on vectors in two-space and three-space, and use the properties of these operations to solve problems, including those arising from real-world applications	
C4 - represent lines and planes using scalar, vector, and parametric equations, and solve problems involving distances and intersections	

Thinking More About Communication:

	Incomplete I	**Unacceptable R**	**Poor 1**	**Acceptable 2**	**Good 3**	**Outstanding 4**
TECHNICAL CORRECTNESS OF SOLUTIONS	All or most solutions are blank	No solutions are correct or many left blank	Few solutions are technically correct	Some solutions are technically correct	Most solutions are technically correct	All or almost all solutions are technically correct
PRESENTATION OF SOLUTIONS	All or most solutions are blank	No evidence of presentation or many solutions left blank	Solutions to few problems stand alone	Solutions to some problems can stand alone	Solutions to most problems can stand alone	Solutions to all or almost all problems can stand alone

Expectation C2

1. Given $\vec{a} = [-7,-8]$ and $\vec{b} = [3,-1]$, determine;

a) $\vec{a} - \vec{b}$

b) $\left| \vec{a} \right|$

c) $-7\vec{a} + 9\vec{b}$

d) Write $\vec{b}$ using the unit vectors $\vec{i}$ *and* $\vec{j}$

e) $\vec{a} \bullet \vec{b}$

2. If $\vec{a} = [-3,1,2]$ and $\vec{b} = [-2,-4,10]$, determine:

a) $\vec{ab}$

b) a vector perpendicular to both $\vec{a}$ *and* $\vec{b}$

c) the angle between $\vec{a}$ *and* $\vec{b}$

d) $3\vec{a} \cdot \left(2\vec{a} - 5\vec{b}\right)$

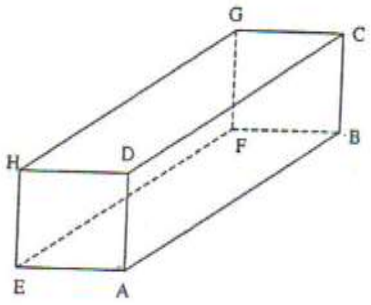
3. Using the diagram below, express each sum as a single vector.

a) $\vec{AB} + \vec{BC} + \vec{CG}$ _____

b) $-\vec{AE} + \vec{DA}$ _____

c) $\vec{AB} + \vec{AD} + \vec{AE}$ _____

d) $\vec{EA} + \vec{HE} - \vec{HC} - \vec{CA}$ _____



4. Determine if the points $A=[-1,-4,1]$ *and* $B=[-4,-1,4]$ *and* $C=[2,-7,-2]$ are collinear.

5. Determine the value of k such that $\vec{u}$ *and* $\vec{v}$ are perpendicular. Given $\vec{u}=[k,-5]$ *and* $\vec{v}=[3,2]$

6. Calculate the area of the parallelogram with vertices at the following points:

P(4 , -2 , -3) , and Q(0 , 2 , 3)

Expectation C4

7. Suppose line L passes through A (1 , 4 , -5) and B (8 , 2 , -6). Express the equation for L in each of the following forms;

a) vector b) parametric c) symmetric

8. Find the Cartesian equation of the plane whose vector equation $\vec{r} = (1,2,-1) + s(1,0,2) + t(-1,3,4)$

9. Write vector and parametric equations for the plane $x - 2y + 5z - 6 = 0$

10. Determine a vector equation and a Cartesian equation for the plane that contains the following 2 lines:

$L_1 : \vec{r} = (4,-3,5) + t(2,0,-3)$ and $L_2 : \vec{r} = (4,-3,5) + s(5,1,-1)$